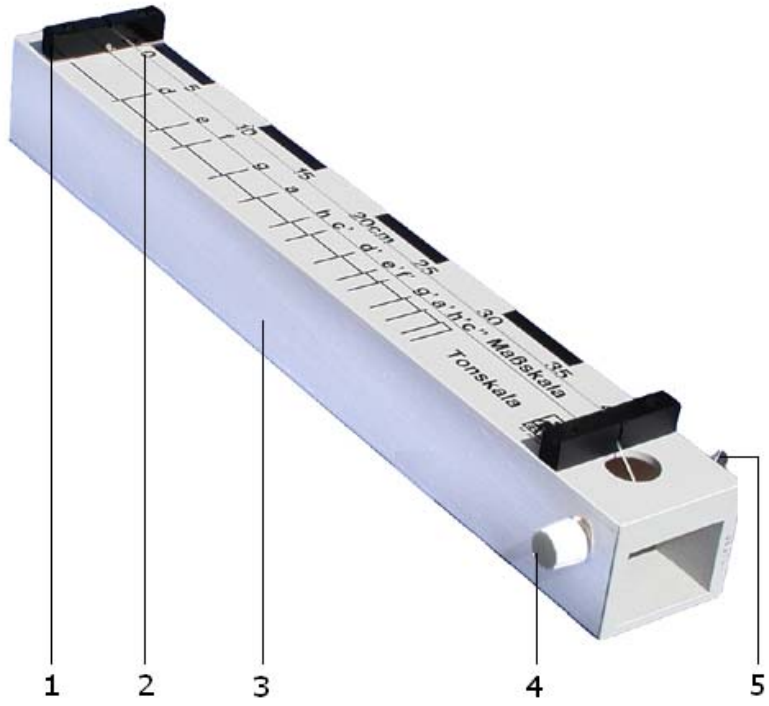
3B SCIENTIFIC® PHYSICS

Monochord U8431216

Instruction sheet

02/08 ALF



1 Fixed bridge
2 String
3 Resonator
4 Knurled screw (tuning peg)
5 Wing screw

1. Safety instructions

Be careful not to apply too much tension to the string. The string might snap and cause injury.

- Do not bend over the resonator while using the monochord.

2. Description

The monochord is used to demonstrate the relation between the pitch of vibrating strings and their tension, thickness and length.

The monochord consists of a wooden box open on both ends, upon which a steel or nylon string is held tight at one end. The tension of the string can be adjusted at the other end by means of a knurled screw that is used as the tuning peg. The length of the string can be varied by moving a bridge. One scale for measuring length and a musical scale are printed on the resonator box.

2.1 Scope of delivery

1 Resonator
1 Bridge
1 Steel string (B string)
1 Nylon string (B string)
1 Dynamometer

3. Technical data

Resonator box:	490 x 70 x 60 mm^3
Scale length:	600 mm
Scale divisions:	in cm
Weight:	0.6 kg approx.

4. Operation

Additionally required:

Tuning forks

- Fit the string onto the monochord. To do this, fit the string into the slot at the left-hand end of the instrument by means of the small metal ring and push the free end through the peg (fig. 1).
- While tightening the peg, tune the string with the help of a tuning fork. Fix the peg with the wing screw.
- Make the string vibrate either by plucking it or bowing it.
- Adjust the desired string length by carefully shifting the bridge and take the reading off the length scale (fig. 3).
- In order to change the tension on the string, slightly loosen the wing screw and set the string tension with the help of the knurled screw. Subsequently tighten the wing screw.
- In order to determine the tension of the string, attach the dynamometer to the monochord and insert the end of the string into the slot of the dynamometer (fig. 2).

The following relations between the string lengths result in a major scale:

Notation of notes	Frequency ratios Key note : higher note	Intervals	Ratios of string lengths Key tone : higher tone
C : C	1 : 1	Prime	1 : 1
C : D	8 : 9	Second	9 : 8
C : E	4 : 5	Major third	5 : 4
C : F	3 : 4	Fourth	4 : 3
C : G	2 : 3	Fifth	3 : 2
C : A	3 : 5	Major sixth	5 : 3
C : H	8 : 15	Major seventh	15 : 8
C : C`	1 : 2	Octave	2 : 1
C : G`	1 : 3		3 : 1
C : C``	1 : 4		4 : 1
C : E``	1 : 5		5 : 1
C : G``	1 : 6		6 : 1

Fig 1

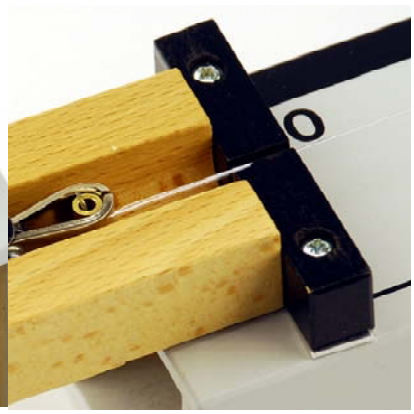


Fig. 2

Fig. 3